

ANNALS *of* PHYSICS

Editor

Herman Feshbach

Assistant Editors

A. Dalgarno

Roman W. Jackiw

Henry Ehrenreich

Arthur M. Jaffe

Editorial Council

A. Arima

L. Kadanoff

R. V. Pound

D. Brink

S. E. Koonin

D. Scalapino

S. Deser

Y. Nambu

F. Wilczek

J. Eisenberg

L. Okun

C. M. Will

J. A. Golovchenko

J. P. Ostriker

K. Wilson

Founding Editors

Philip M. Morse

Bernard T. Feld Herman Feshbach Richard Wilson

VOLUME 229 • 1994



ACADEMIC PRESS, INC.

Harcourt Brace & Company

San Diego New York Boston

London Sydney Tokyo Toronto

Copyright © 1994 by Academic Press, Inc.

ALL RIGHTS RESERVED

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per copy fee through the Copyright Clearance Center, Inc. (222 Rosewood Drive, Danvers, Massachusetts 01923), for copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Copy fees for pre-1994 articles are as shown on the article title pages; if no fee code appears on the title page, the copy fee is the same as for current articles.

0003-4916/94 \$9.00

This journal is printed on acid-free paper.



Printed by Catherine Press, Ltd., Brugge, Belgium

CONTENTS OF VOLUME 229

NUMBER 1, JANUARY 1994

STANISŁAW MRÓWCZYŃSKI AND ULRICH HEINZ. Towards Relativistic Transport Theory of Nuclear Matter	1
AKIVA NOVOSELSKY AND JACOB KATRIEL. Harmonic Oscillator SU_3 States with Arbitrary Permutational Symmetry	55
SATISH D. JOGLEKAR AND GAITRI SAINI. A Most General Formulation of Anomalies and Their Family Structure in QED in Path Integral Formulation	76
R. ALCORTA AND J. A. GRIFOLS. Electro-weak Corrections to the Hyperfine Structure of Positronium	109
G. PROFILO AND G. SOLIANI. Alternative Lagrangians and Fouled Hamiltonians for the Time-Dependent Oscillator.	160
HIROYUKI HATA AND BARTON ZWIEBACH. Developing the Covariant Batalin-Vilkovisky Approach to String Theory	177
ABSTRACTS OF PAPERS TO APPEAR IN FUTURE ISSUES	217

NUMBER 2, FEBRUARY 1, 1994

AHMET ELÇİ. Gauge Properties of the Position Operator in Crystals	221
S. KELLER AND R. M. DREIZLER. On the Local Description of Pair Production in Inhomogeneous External Fields.	252
H. SCHOELLER. A New Transport Equation for Single-Time Green's Functions in an Arbitrary Quantum System. General Formalism	273
H. SCHOELLER. General Transport Theory for Weak Inhomogeneities and Quantum Solids in High External Fields	320
MASAO HIROKAWA. Mori's Memory Kernel Equation in Equilibrium Quantum Systems in Finite Volumes	354
MORDEHAI MILGROM. Dynamics with a Nonstandard Inertia-Acceleration Relation: An Alternative to Dark Matter in Galactic Systems	384
O. BERGMAN AND G. LOZANO. Aharonov-Bohm Scattering, Contact Interactions, and Scale Invariance	416
ABSTRACTS OF PAPERS TO APPEAR IN FUTURE ISSUES	428
AUTHOR INDEX FOR VOLUME 229	430



Figures should be numbered consecutively with Arabic numerals in order of mention in the text; each figure should have a descriptive legend. Legends should be typed together on a separate sheet, double-spaced. All figures and illustrations are to be submitted in such form as to permit photographic reproduction without retouching or redrawing. Lettering on drawings should be of professional quality or generated by *high-resolution* computer graphics and should be large enough (10–12 points) to take a reduction of 50–60%. Drawings should be made with black India ink on tracing linen, smooth-surface white paper, or Bristol board, no larger than 8.5 × 11.5-inches overall (21 × 27.5 cm). Alternatively, *high-quality* computer graphics may be acceptable. Graph paper, if used, should be ruled in blue. High-quality glossy prints are acceptable. **Photocopy prints are not acceptable**; however, copies of figures must be included in each copy of the manuscript.

Tables. Number tables consecutively with Roman numerals. Extensive tables will be reproduced photographically and so should be typed carefully and in the *exact* format desired. Authors will be charged for any new photoreproductions necessitated by changes in proof. Use superscript lowercase italic letters for footnotes and type immediately below the table. Type tables double-spaced, including titles and footnotes. Do *not* underline table titles; reserve underlining for text that is to be *italicized*.

Equations should be typewritten and the number in parentheses at the right margin. Reference to equations should use the form “Eq. (3)” or simply (3). Superscripts and subscripts should be typed or handwritten clearly above and below the line, respectively. Use the exponent $^{1/2}$ wherever possible.

“Style.” In general, authors should be guided by the *Style Manual*, 1990, of the American Institute of Physics, 335 East 45 Street, New York, NY 10017, **but**

References should be styled and punctuated according to the following examples:

1. H. D. SIVAK, *Ann. Phys. (N.Y.)* **159** (1985), 351.
2. G. B. ARFKEN, “Mathematical Methods for Physicists,” 3rd ed., p. 20, Academic Press, New York, 1985.
3. J. M. AITKEN AND E. A. IRENE, in “Treatise on Materials Science and Technology” (H. Herman, Ed.), Vol. 24, p. 50, Academic Press, New York, 1985.

Cite references in the text by an Arabic numeral between square brackets, as [1], [1, 2], [1, Theorem 1.5], etc. Type references consecutively on a separate page, double- or triple-spaced throughout.

Footnotes in text should be avoided if at all possible. If they must be used, identify by superscript numbers and type together on a separate page, double- or triple-spaced.

Proofs. Proofs will be sent to the author, with a reprint order form. Authors will be charged for alterations in excess of 10% of the cost of composition.

Reprints. Fifty reprints without covers will be provided free of charge. Additional reprints may be purchased; an order form will be included with the proofs.

Atomic Data and Nuclear Data Tables

Editor

Angela Li-Scholz

State University of New York at Albany

Consulting Editors

S. Raman

Oak Ridge National Laboratory, Tennessee

Wilfried Scholz

State University of New York at Albany

Atomic Data and Nuclear Data Tables presents compilations of experimental and theoretical information in atomic physics, nuclear physics, and closely related fields. The journal is devoted to the publication of tables and graphs of general usefulness to researchers in both basic and applied areas. Extensive and comprehensive compilations of experimental and theoretical results are featured.

Research Areas Include

- Collision processes
- Energy levels
- Interaction cross sections
- Penetration of charged particles through matter
- Spectroscopy
- Transition probabilities
- Wavefunctions
- X rays

Volumes 56–58 (1994), 6 issues (including cumulative author & subject indexes)

ISSN 0092-640X

In the U.S.A. and Canada: \$390.00

All other countries: \$460.00

A cumulative index and privileged personal rates are available upon request.
For more information, please write or call:



ACADEMIC PRESS, INC.

Journal Promotion Department

525 B Street, Suite 1900, San Diego, CA 92101-4495, U.S.A.

(800) 894-3434

